iNDUCE 4.0

Work-based training for a competitive European Industry

Practical methodology for Work-Based Learning

"Quick User's Guide" included

GLOSSARY

Apprenticeships are work-oriented trainings that are part of vocational education and training (VET) and that formally combine periods of practical work experience at a workplace with periods of theoretical/practical education followed in a school or training centre, and whose successful completion leads to nationally recognised qualifications.

Internships are work-based learning opportunities, either taking place as part of formal education (with interns having a student status) or outside of formal education (also after graduation), during which a person spends a period of time in an enterprise or organisation to acquire specific competencies required by the labour market.

Work-Based Learning is an educational strategy that provides students with real-life work experiences where they can apply academic and technical skills and develop their employability. Depending on the country and the type of agreement between the student and the company, it could be an internship, an apprenticeship, a mentorship, or any other kind of learning experience involving learning providers and companies.

This handbook is meant to guide SMEs, learners and trainers to efficiently use the e-learning platform of Erasmus+ project iNduce 4.0 with a view to develop the vocational skills which are dramatically needed to support European SMEs in the field of Industry 4.0.

SMEs need to take on the challenge and opportunities of e-learning and related new learning technologies.

In order to do so, SMEs need to overcome some major obstacles such as:

- the issue of the limited resources they can rely on with respect to big companies;

- the reluctance SMEs´ employees show with respect to e-learning and the new technologies.

iNduce 4.0 has been developed to the purpose of providing SMEs with an affordable and flexible training which could be best adapted and customised to their specific needs. The iNduce 4.0 e-learning platform can be approached in different ways, depending on the specific needs of the user. Furthermore, it allows both SMEs´ managers and employees to adapt the new disruptive tools and methodologies provided by e-learning to their best advantage.

This handbook intends to provide a practical methodology and orientation for SMEs to use the iNduce 4.0 training and get the most out of it.

It is structured around five simple questions:

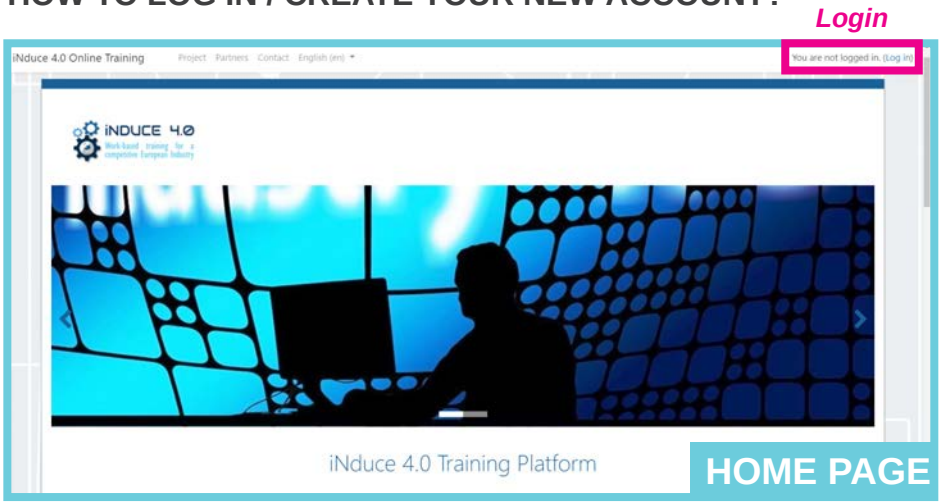
I.What is the iNduce 4.0 training?
II.Why has it been developed?
III.Who is going to benefit from it?
IV.How can it be employed to the best advantage of its users?
V.Where will it be used and which specific adaptations to national and local contexts are required?

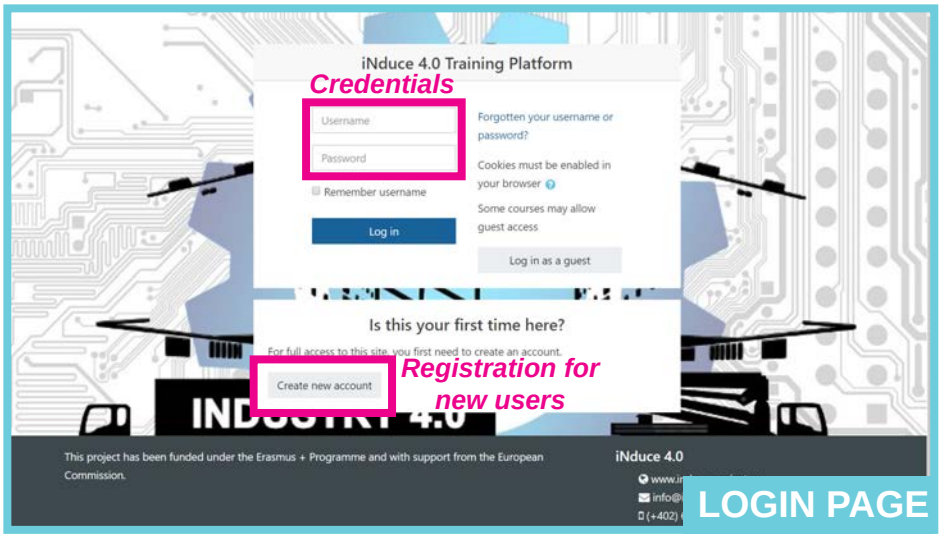
But first, let us start with the “quick user’s guide of the iNduce 4.0 e-learning platform”. How do you log in / create your account? How do you access the modules? How can you monitor your progress? And finally, what can you do with your user profile options?

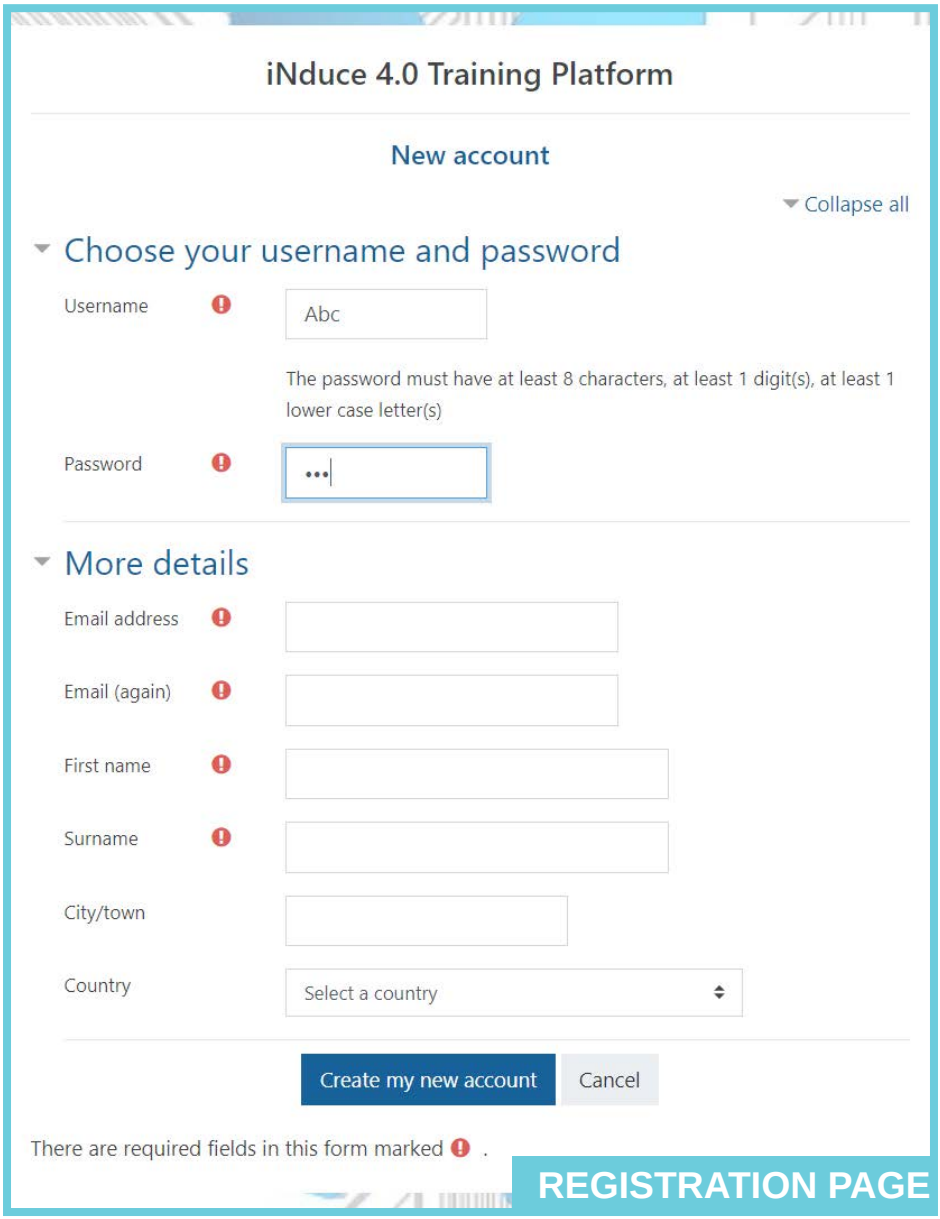
iNduce 4.0 online training
QUICK USER'S GUIDE

http://training.induce-project.eu/

HOW TO LOG IN / CREATE YOUR NEW ACCOUNT?



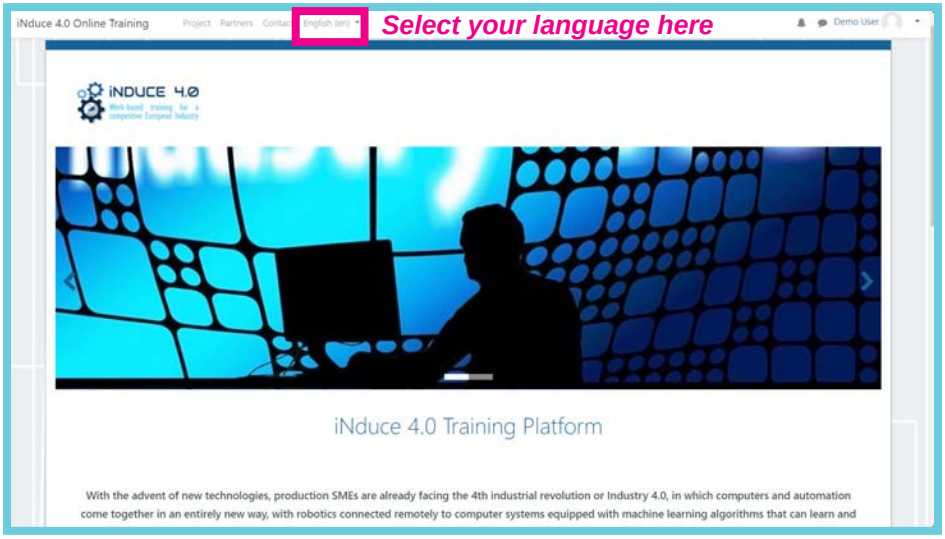



iNduce 4.0 Training Platform
New account
Collapse all
Choose your username and password
Username
Abc
The password must have at least 8 characters, at least 1 digit(s), at least 1 lower case letter(s)
Password
More details
Email address
Email (again)
First name
Surname
City/town
Country
Select a country
Create my new account
Cancel
There are required fields in this form marked .
REGISTRATION PAGE

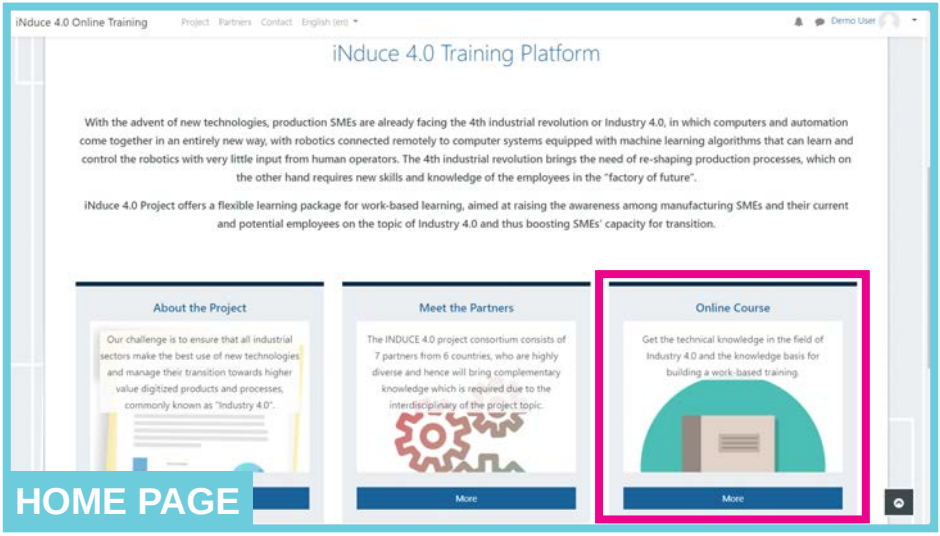
HOW TO ENROLL TO A TRAINING COURSE?

After registration, you have to choose a training course to enroll yourself and then start studying.

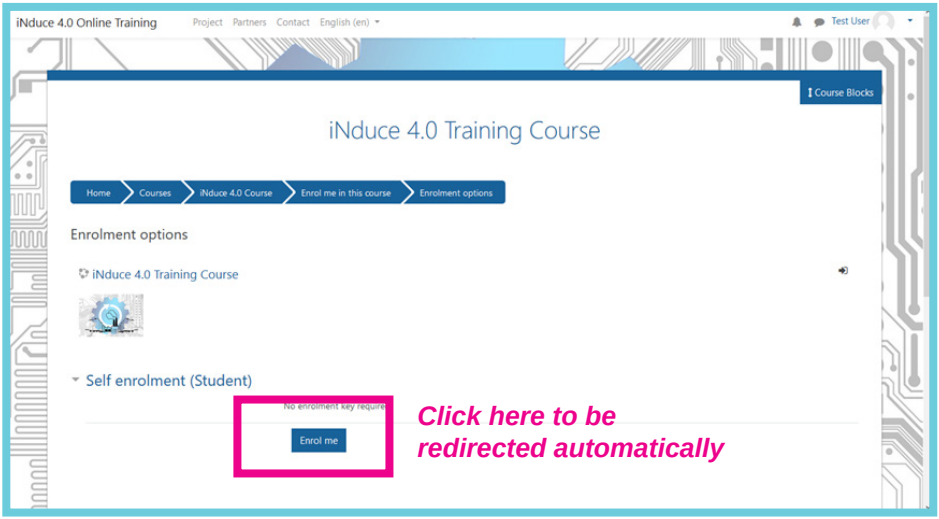
First you should select your language: English, Romanian, Bulgarian, German, Greek or Portuguese.



Then click on "Online Course"



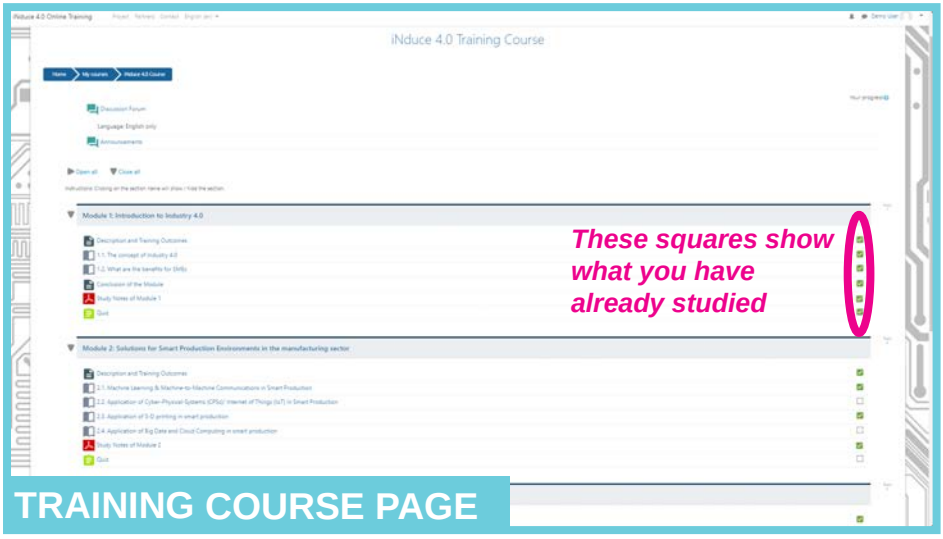
And finally, enroll yourself to the training course by clicking on “Enrol me”



Each of the 4 Modules includes:

- *Description and Outcomes*
- *Subsections*
- *Conclusion*
- *The material in pdf for download*
- *Quiz*

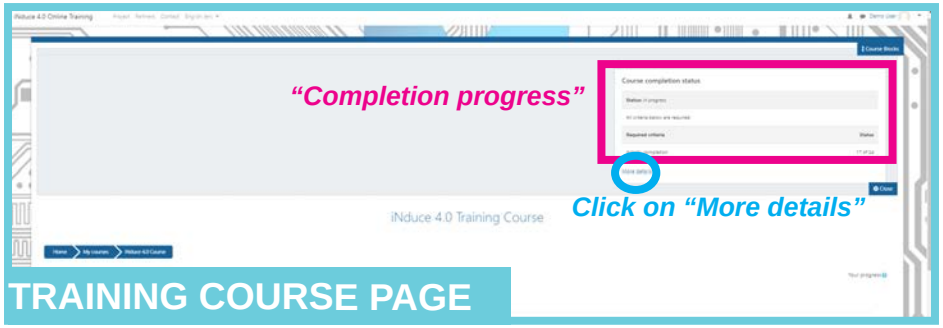
HOW TO CHECK YOUR COMPLETION PROGRESS?



You can also check your progress by clicking on “Course block”.

TRAINING COURSE PAGE

It will show you an overall view on your completion progress.

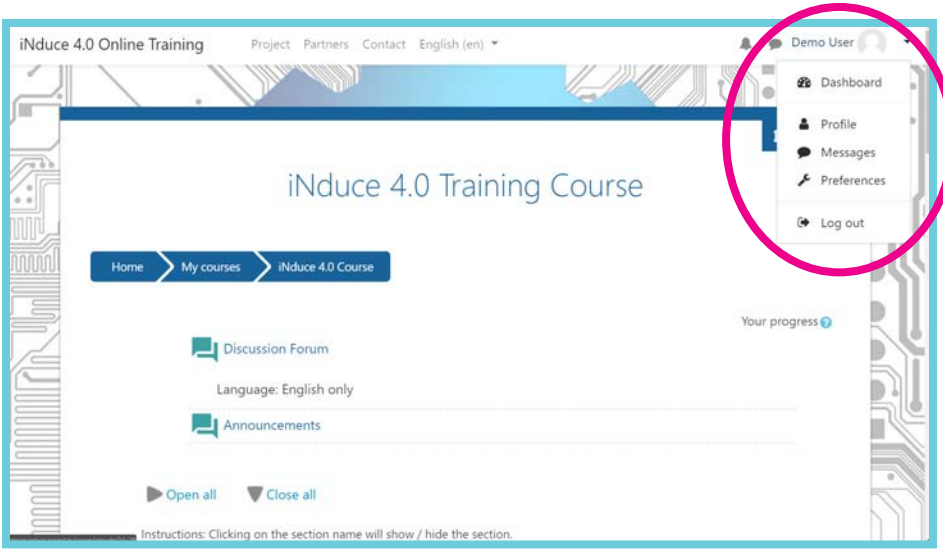


TRAINING COURSE PAGE

You can click on “more details” for... more details on your completion progress.

DETAILED PROGRESS COMPLETION PAGE

USER PROFILE: WHAT CAN YOU DO?



When you click on the small arrow next to your profile picture, it will show:

- ***Dashboard:*** *It will show the courses you enrolled.*
- ***Profile:*** *settings of the profile. Also, here you can 'Contact the privacy officer' and 'Request your saved data'.*
- ***Messages:*** *you can exchange (send/receive) messages with other participants and teachers.*
- ***Preferences:*** *Change password, Preferred language etc.*

THANK YOU

I. What is iNduce 4.0?

Structure and Content of the e-learning Platform

iNduce 4.0

Module 1: Introduction to Industry 4.0

1.1. What is Industry 4.0?
1.2. What are its benefits for SMEs?
> Conclusion Module 1

Module 2: Solutions for Smart Production Environments in the manufacturing sector

2.1. Machine learning & Machine-to-machine (M2M) communications in smart production
2.2. Application of Cyber-Physical-Systems (CPS) / Internet of Things (IoT) in smart production
2.3. Application of 3-D printing in smart production
2.4. Application of Big Data and Cloud computing in smart production
> Conclusion Module 2

Module 3: Smart Robotics

3.1. Introduction to Smart Robotics
3.2. Industrial Robots – Programming and Applications
3.3. Mobile Robots and their Applications
> Conclusion Module 3

Module 4: Application of CPS/IoT across the process chain

4.1. Vertical networking of smart production systems
4.2. Horizontal integration via a new generation of global value chain networks
4.3. Acceleration through exponential technologies
> Conclusion Module 4

Module 1: Introduction to Industry 4.0

This module aims to offer a broad perspective on the concept of Industry 4.0, widely used to refer to the 4th Industrial Revolution or the digital revolution in industry. Industry 4.0 is characterized by the convergence of breakthrough digital technologies that are transforming production processes and business models across different industries, through the integration of cyber-physical systems (CPS), the internet of things (IoT), artificial intelligence (AI), cloud and cognitive computing, smart robotics, virtual and augmented reality, the internet of services (IoS). The basic principle behind Industry 4.0, where factories have taken on the label of “smart”, is that by chaining machines, intelligent devices and systems, manufacturers are creating smart networks that can control each other throughout the value chain, from purchasing materials and services to production and distribution.

Module 2: Solutions for Smart Production Environments in the manufacturing sector

- Machine learning & Machine-to-machine (M2M) communications in smart production: This section presents a broad introduction on Machine Learning and Machine-to-Machine communication techniques. It introduces the science of getting computers to act without being explicitly programmed, provides insights and perspectives enabling Machine-to-Machine (M2M) solutions and analyses their value in Smart Production.
- Application of Cyber-Physical-Systems (CPS)/ Internet of Things (IoT) in smart production: This section refers to the design and analysis of Cyber-Physical Systems - computational systems that are integrated with physical processes. It introduces the principles, tools, models and processes involved in cyber-physical system development for Manufacturing companies. Implementation of IIoT / IoT sensors within manufacturing operations, process automation and advanced analytics are the main topics of this section.
- Application of 3-D printing in smart production: This module provides an overview of 3D printing, the classification of 3D printing technologies and the most common 3D printing technologies: Fused Deposition Modeling (FDM), Stereolithography and Digital Light Processing (SLA & DLP), Selective Laser Sintering (SLS), Material Jetting (PolyJet and MultiJetModeling), Binder Jetting and Metal Printing (Selective Laser Melting and Electron Beam). An overview of today’s 3D printing industry is presented, and the role of 3D printing in manufacturing processes is discussed. Furthermore, the benefits of 3D printing are discussed.
- Application of Big Data and Cloud Computing in smart production: This module explains what Big Data and Cloud Computing are, as well as the relationship between them. The stunning growth of Big Data, the way it works and the transformation it brings to the industry are presented through examples from manufacturing, transportation, supply chain management and logistics. Data collection, transportation, pre-processing, storage and obstacles in the development of Big Data applications are discussed. Some applications of Big Data within the corporate world are presented through case studies in the steel, automotive and electric industry.

Module 3: Smart Robotics

- Introduction to Smart Robotics: This section is an introduction to the module on smart robotics. It provides the historical background, general information and an explanation of what robots are and what role they play in the present and in the near future.
- Industrial Robots – Programming and Applications: Robots play an important role in the present-day manufacturing industry. The number of multipurpose industrial robots developed by players in Industry 4.0 has been growing very rapidly during the last years. An essential aspect of Industry 4.0 is autonomous production methods powered by robots that can complete tasks intelligently, in a safe, flexible, versatile and collaborative fashion. Without the need to isolate its working area, its integration into the human workspace becomes more economical and productive and unfolds many possible applications in industries. This section provides an overview of collaborative industrial robots.
- Mobile Robots and their Applications: Mobile robots are automatic machines capable of moving in any environment. They are used in research, monitoring, remote monitoring and many other applications. This section provides a short introduction to mobile robotics and some examples of their applications.

Module 4: Application of CPS/IoT across the process chain

- Vertical networking of smart production systems: In this section, the focus will be on vertical networking of smart production systems. Through vertical networking of the smart factory's cyber physical systems, changes in stocks or demand or even faults in equipment are quickly addressed. Both production and maintenance management of the factory can be organised automatically and independently of each other. With real-time virtualisation of everything in the factory, parts and equipment can be located anywhere and the workflows are self-organised for optimum efficiency.
- Horizontal integration via a new generation of global value chain networks: In this section, the focus will be on horizontal integration via a new generation of global value chain networks. Horizontal integration brings the efficiency of the network to other outside organisations, such as subcontractors, suppliers, logistics service providers, distribution points and customers. As products become more integrated with the Internet of Things, through embedded electronics and communication technologies, the link with the manufacturer is maintained throughout its life cycle.
- Acceleration through exponential technologies: In this section, the focus will be on exponential technologies which represent one of the major characteristics of Industry 4.0 serving as a catalyst for improvements in the manufacturing process. These technologies are evolving and enabling change at an accelerating pace. Innovation through exponential technologies can help manufacturers develop faster, be more flexible and unlock new forms of value.

II. Why has iNduce 4.0 been developed?

The iNduce 4.0 e-learning courses structure is the result of a large-scale survey conducted among two target groups: manufacturing SMEs and VET providers/ trainers/consultants.

The survey has been carried out during the period between November 2017 and January 2018 across 6 European countries: Romania, Poland, Portugal, Germany, Bulgaria and Cyprus.

In total, 117 SMEs and 77 VET providers participated in the survey.

Based on the results of the survey, the iNduce 4.0 training course was developed on the ground of the following key points:

- The topic of Industry 4.0 is considered important but there is a low level of awareness of the subject at company level.
- SMEs are better acquainted with the industry concept than VET providers' representatives.
- A comprehensive package of training materials will be highly appreciated with focus put on Module 1 "Introduction to Industry 4.0" and Module 2 "Solutions for smart production environments in the manufacturing sector".
- Only one or two skills are not enough when it comes to Industry 4.0 but a set of skills is needed. iNduce 4.0 methodology should address as many skills as possible with focus on Complex Problem-Solving Skills, Technical skills and Systems skills.
- iNduce 4.0 training course should be more practice-focused with the option to be tailored to a different way of teaching such as a workplace training, blended learning, online courses.
- The educational portal on which the iNduce 4.0 course and methodology will be available should have interactive evaluation tests, option to download files and discussion forums.

Important findings about Work-based learning (WBL) that came out of the survey:

- Few of the participating VET organisations providing onsite training programmes to companies offer any training related to Industry 4.0. One reason for this might be the fact that the topic is still new, and VET organisations haven't yet managed to develop courses and they are not yet familiar enough with the topic. Other reasons are also linked to the lack of information resources, low demand / interest in educational service, reluctance of employers and employees in coping with this new thematic.
- In comparison, SMEs pointed out two different obstacles in applying WBL programmes for new employees/ students: lack of time and resources, lack of theoretical materials to combine with practical elements, legal regulations.
- The level of awareness on the topic combined with the lack of information resources and theoretical and practical materials pointed out by SMEs and VET stakeholders as obstacles towards organising WBL confirms the importance of the project and the need of such training materials and courses.

III. Who will benefit from iNduce 4.0?

All levels of SMEs are going to benefit from the iNduce 4.0 training course.

SME Managers need to know about new technologies that can be applied to their companies to survive and develop in a competitive market. Acquiring skills and knowledge in Industry 4.0 can be the key to the success of a business. This can be achieved in many efficient ways, including Work-based learning (WBL) using the e-learning platform iNduce 4.0.

Upgrading to Industry 4.0: its Benefits and Opportunities

- Increased productivity
- Improved risk management
- Real-time tracking, monitoring, automation
- Enhanced predictability of insights and actions
- Optimised technology through the convergence of Information Technology (IT) and Operational Technology (OT)
- Remote and predictive maintenance of machines
- Optimised machine operations
- Energy and environment monitoring and remote management
- Self-sustained operations – machine learning-based robotic process automation of machines.

Benefits of the training using iNduce 4.0 e-learning platform

Benefits for the learner:

- **To develop work-based learning and work-related skills simultaneously.**
- **Exploiting the workplace as a learning resource.**
- **Using existing knowledge activated as a foundation for new knowledge.**

Benefits for the employer:

- **Flexible, tailored to their needs.**
- **Can lead to an improved workforce performance and productivity.**
- **Increases employee motivation – higher staff retention.**
- **Meets skills shortages.**
- **Work-based learning - little time off the job, minimal disruption.**

IV. How can iNduce 4.0 be employed to the best advantage of its users?

Induce 4.0 can be employed to the best advantage of its users thanks to its flexibility which allows a customised adaptation of its learning tools to the specific needs of each user.

Must know:

Once you sign in in the platform you can directly start from any of the modules available on iNduce 4.0. You are also able to download all its content in PDF (Chapters, Study Cases and the Evaluation tests) for your learning or your teaching purposes.

ADVICE: START WITH MODULE 1

It is important to point out that, even though e-learning presents many advantages, it is not exempt from some drawbacks. The most effective way to minimise the latter is to recur to blended learning: getting the most of an e-platform such as iNduce 4.0 by mixing online and face-to-face training. *(source: "The Use of e-Learning in Vocational Education and Training (VET): Systematization of Existing Theoretical Approaches" by Vera Belaya - 2018).* It is therefore highly advisable to complement the self-learning provided by the e-platform with moments when the trainee can be supported by a trainer or facilitator and learn within a physical learning environment through the exchange with both peers and the more experienced.

There is more than one reason why SMEs managers might and should opt for the use of work-based learning:

- **WBL can have a positive impact on the company**
- **WBL can improve the company´s reputation**
- **WBL can increase the confidence of the team through up-skilling**
- **WBL can create opportunities for Public-Private Partnerships**

"72% of small to medium sized enterprises state that the chance to train potential future employees is the key reason they offer traineeships."
European Commission, 2013

When opting for work-based learning through the iNduce 4.0 platform, the manager should customise and adjust the learning tools to the specific profile and needs of the enterprise through a series of steps.

First of all, the manager should go through all the modules available in the platform in order to select the ones needed by the company.

Here, the crucial questions he/she should ask him/herself should be:

- **What technologies and skills are currently used to run the daily operations of the company?**
- **What technologies should or could be updated?**
- **What skills need to be improved to better reach the targeted goals?**
- **Which skills and technologies could be crucial to invest on to catch up with competitors?**

By answering to these questions, the manager starts identifying potential weaknesses or backwardness pertaining to the specific production goals of the company. On that basis, the managerial level can define the most convenient investments to be done.

It is important to highlight that in the IT era, the most profitable investments are not necessarily those in machines and technologies, but rather those in training and upskilling the human resources involved in the production process.

A preliminary overview of all the available modules is not of course required only on the side of the SMEs managers but also on that of the VET providers. These latter also need to go through all the iNduce 4.0 course, but within a slightly different perspective: their focus should be the improvement of their trainees´ knowledge in a specific field and/or on specific subjects which are part of the established curriculum.

VET providers should also get well acquainted with the contents of the platform in order to be better able to select them according to the specific aims of the training they need to provide.

A - Guidelines to SME Managers/Consultants/Vet Providers

SMEs Managers know that they need to keep up with the latest innovations and technologies if they want to live and thrive in a competitive global market. They need to develop their own skills and knowledge in Industry 4.0 and to make sure that their current and future workforce is up-to-date to succeed.

SMEs' Managers need to ask themselves these questions before even considering their employees and their own training in Industry 4.0:

Purpose of the training	Why do I need my employees to know more about Industry 4.0?
Measurable objectives	What measurable results are desired over time?
Identification of the needs	What competencies are needed for succeeding now and in the future?
Measure potential and identify gaps	What are the Opportunities/Challenges?
Evaluate results of training	How have the defined objectives been met?

By its flexibility in terms of time and costs, WBL/apprenticeship using an e-learning platform can be an appropriate solution to meet SMEs' training requirements. The decision to engage in training using e-learning depends on the needs identified through a "Learner Needs Analysis".

This can be done by SMEs' Managers themselves, but also by VET Providers in the preparation of delivering training courses to SMEs employees.

The “Learning needs analysis”

The Learning needs analysis provides an opportunity to reflect on what skills/ knowledge you will need to succeed, what skills/knowledge you already have, and what skills/knowledge you need to develop.

The Learning Needs Analysis (LNA) is a review of learning and development requirements that is designed to support individual, team and organisational development. It is a recognised developmental tool that evaluates an employee’s skills, knowledge and behaviours in order to meet the organisational demands together with an assessment of any current or anticipated gaps in learning. The aim of the exercise is therefore to bridge any highlighted gaps through adopting various methods of support and development.

(Source: http://www.ucl.ac.uk/hr/od/resources/learning%20NeedsAnalysisFramework.pdf)

Learning Needs Analysis (LNA) Form	
Task/Skill/ Knowledge	What task or skill does the employee need to know to carry out their role effectively? Has the employee any knowledge on the subject? This could range from having an understanding of a particular subject, to more complex issues that require training, coaching etc.
Expectations of the manager	What is necessary for the employee to know in order to make the team/organisation function effectively? Does it meet with organisational objectives? Is it a realistic and achievable goal?
Identified gaps in learning/ understanding	Does the employee recognise those gaps? What is required in order to reach competence in that skill/task?
Previous Experience and training	What does the employee already know? How long ago was their previous experience or training on a particular matter? Is it still relevant? Have there been changes in legislation, procedure, culture etc.
How this will be achieved	Could there be alternative ways of learning than to send on a course?
How this is going to be evaluated	What processes are in place to ensure that it has been achieved, how is it going to be measured, what are the timescales?

B - Comprehensive apprenticeship programme based on the INDUCE 4.0 course that will serve as a tool

An efficient WBL/apprenticeship programme established by SMEs' Managers and VET providers requires from them to commit to the quality standards and code of conduct dictated at national level as well as to the ones stated in the "*European Quality Charter on Internships and Apprenticeships*".

The Guide to quality WBL

Before the apprenticeship/internship

Assessment	• Skills assessment: what are the skills needed for the company? Different department of the company must be consulted to identify specific areas of work to which an intern could contribute • How many interns do the company need?
Relations	• Approaching educational institutes (universities, technical schools, training centres and other educational facilities) that can provide you with the worker equipped with the skills needed. > This can create a solid bridge of skills between the company and the educational institutes
Structured Programme	A clearly defined programme will ensure that an apprenticeship /internship in the company is valuable and will help it attract young talents. The programme should ensure that: • The intern has clear, written learning goals to be achieved • The intern is given the opportunity to see different areas in the company • The intern has a planned and structured training using iNduce 4.0 on-site: an optimal "abstract/concrete" learning balance • The intern is given a range of tasks to ensure the development of different skills foreseen in the programme • The intern is given the opportunity to learn from other employees • The intern has regular meetings with a supervisor to monitor progress
Efficient Recruitment	A well-prepared recruitment process will not only save you time, but it also increases the guarantee of getting the right person in the company. • Create a clear job description, including skills and competencies the company needs. • Stating in the job description that there are in-house trainings on Industry 4.0 will entice motivated people eager to improve their skills. • Ensure length of the apprenticeship/internship and the remuneration / reimbursements details are clearly stated. • Always give feedback to the interviewed people so they can improve their interview skills. This will create a positive image surrounding the company towards young talents.

During the apprenticeship/internship

Induction Checklist	It is crucial for the intern to have a positive experience in the company. To ensure it, here is a checklist for his first days in the company: • A good introduction to the company, its values and missions, as well as to all the staff • A tour of the facilities • Providing him with relevant health and safety information • Giving him a copy of the working rules and the Code of Conduct • Making him aware of complaints channels available • Going through his desired learning objectives, as well as tasks and duties stated in the job description • Planning of the training (iNduce 4.0) through his time in the company
Supervision	It is important for the intern to have supervisors who are trained in their responsibilities. This ensures that the intern feels supported and being part of a concrete learning process while the company is making the most of his skills and time: • Establish monthly assessments to review progress and satisfaction • Establish a mid-term review to assess progress against the written learning objectives
Training	Giving the possibility to interns to receive in-house trainings enhances their professional skills. Trainings in Industry 4.0 is not only essential for the future of their career, but also for the company: • It is important to go through iNduce 4.0 to select relevant modules for the intern as well as for the company • A good training must be well balanced between learning “abstracts” and applying them on-site. • Having a professional trainer is of course ideal but can be expensive. The alternative would be having an in-house trainer (e.g. the intern’ supervisor) who possesses pedagogical skills. > Do not forget to deliver other trainings on other topics from Human Resources, Finance, Safety, etc. > Obviously, trainings are intended for all employees: the company needs to ensure that all employees improve their knowledge and skills and learn new ones by delivering regular training sessions (in-house, in training centres, online through e-learning, etc.)
Compensation	Giving a fair compensation to interns means: • No discrimination toward young people • Incentive for motivation and commitment at work • Making them part of the staff of the company, not just as cheap/free workforces > Be a leading example for corporate social responsibility

At the end of the apprenticeship/internship

Review of Learning	It is highly advised for the company to include an end-of-internship/ apprenticeship presentation for the intern: • What they have done • What they have learnt
Evaluation	The internship/apprenticeship evaluation should include: • How well the learning objectives are met? • What projects have been completed or contributed to? • What knowledge and skills make the intern more prepared for the labour market? • What areas of improvement regarding the WBL process have been identified? > Important discussions to have: • if an option, discuss the possibilities of the intern remaining in the company as a permanent employee • Feedback from the intern to the supervisor. The supervisor and the company as a whole can learn from the intern themselves > The company should give the intern a letter of reference or a written certification. These documents are invaluable for future job applications

V. Where will WBL be used and which specific adaptations to national and local contexts are required?

WBL/apprenticeship programmes and e-learning are considered as two of the global driving factors for the development of education and economy in many countries. Conditions to WBL, however, vary from one country to another.

Relevant differences in the application of WBL even within the European Union.

Legal Framework for regulations of WBL/apprenticeship in each country or lack thereof

The Legal Framework for regulation of WBL/apprenticeship can be very different from one European country to another. Efforts are constantly being made by governments and policymakers to improve the regulation in their educational/VET systems to increase SMEs commitment to WBL/apprenticeship.

It is important for entrepreneurs and VET providers to perfectly know the rules in their country/regions, and to always be informed about the changes that can be made every year.

As mentioned earlier, Work-Based Learning can be a potential win-win with the right combination of conditions.

SME Managers/VET providers need to know the current conditions that apply.

Here are some that they can explore:

Financial Incentives

- Tax incentives: specific incentives tailored to SMEs could act as an important stimulus for increasing their investment in training;
- Training funds: these funds (that can be mandatory) are designed to increase the resources for apprenticeship training;
- Vouchers/grants/others: used both by public authorities and social partners, these mechanisms can be designed to achieve several purposes such as increase quality, encourage the creation of new apprenticeship places, activate or reactivate companies to provide apprenticeship placements, etc.

Business Environment

Are there coordinated strategies involving Chambers of Commerce, Sectoral Federations, VET Providers, Employers Organisations, Trade Unions, Public Employment Services, etc.?

For example:

- Inter-Company Resource networks or partnerships: they allow pooling of resources, sharing information, exchanging knowledge, developing ideas and learning from each other's experiences. Such networks or partnerships can take different shapes, depending on members' needs.
- School-Company partnership: training centres equipped to provide all learning content in full are often set up by sectoral business organisations and support SMEs willing to offer an apprenticeship.
- Local support provider: it is possible to find local infrastructures that can support and assist SMEs in setting up, planning, delivering, and ensuring the quality of their apprenticeships, including apprentice assessment.

The Support in Company Trainers and Mentors

Availability of competent in-company trainers is crucial to ensuring a good learning experience for apprentices in companies. In-company trainers must be given opportunities to develop and/or regularly update their technical and pedagogical skills. In addition, they are also expected to have both a qualification in the profession they teach and proof of pedagogical/didactic competence. To meet this requirement, SMEs need targeted support focused on flexible and customised training provision for trainers.

In the early process of the conception of iNduce 4.0 in 2018, the different partners laid down the current legal framework for regulations of WBL/apprenticeship of the following European countries: Romania, Poland, Germany, Portugal, Bulgaria and Cyprus.

WBL in Romania

In Romania, WBL is embedded in the national legislation as a cross-section subject. The general legal framework is set at a national level provided by The Law of National Education no.1/2011 with its further amendments and completions. Because of this, the framework is the same for the whole country.

Given that no mention is made of WBL, we can conclude that in Romania there are no specific legal requirements for companies to participate in WBL initiatives. All enterprises can engage in apprenticeship contracts provided that they have the necessary facilities and they supply the local Labour Directorates of the Ministry of Labour and Social Justice with proof that they have a specifically designed training programme for the occupation for which they wish to organize apprenticeships.

In Romania there is a different legislation regulating apprenticeship and internship.

Apprenticeship is organised for persons who want to work and to obtain a qualification (young school dropouts, NEETs, both short and long-term unemployed, adults). It is not considered part of IVET and there is a special law on apprenticeship. According to the Apprenticeship Law, work-based apprenticeship is regarded as a special and distinct form of vocational training combining employment with vocational training provided by the employer.

The apprenticeship conditions are settled through apprenticeship contracts, which have been defined as a special type of labour contracts of a determined duration involving both work and vocational training at the workplace. The contract as such cannot be longer than three years or shorter than six months, in accordance with the level of qualification to be provided.

According to the Apprenticeship Law and its application norms, those entitled to apprenticeship are the individuals over 16-year-old, provided that they have no prior qualification in the trade for which they request entering into an apprenticeship contract. The apprentice is considered a full-time employee and is entitled to all associated rights (minimum salary, working time regulations). The apprentice also has to benefit from theoretical training which is to be provided inside the working hours.

The work-based apprenticeship programme is organised only for qualifications for which there are occupational standards / professional training standards and occupations included in the Romanian Classification of Occupations (Codul Ocupatiilor din Romania - COR).

The minimum duration of the apprenticeship training is equal to the duration provided by regulations on the adult training qualification courses. The necessary time for the theoretical training of the apprentice is included in the regular working hours. The monthly salary provided by the apprenticeship contract is at least equal to the national gross minimum salary. The working programme is 8 working hours/day, 40 hours/week. For people younger than 18, the working programme is 6 working hours/day, 30 hours/week.

The Ministry of Labour and Social Justice, through the local Employment Agencies monitors and controls the activity of the authorised training providers delivering work-based apprenticeship programmes.

Internship in Romania is understood as a practice within companies of pupils and/or students, according to the present legislation (Law 258/2007). According to the law, the

practice of pupils/students is organised by the training provider (educational institution) based on a contract concluded with a practice partner.

The latter is a company or any other legal person carrying out an activity pertaining to the specialization for which pupils/students are trained. Practical work can be done on a weekly or cumulative basis at the end of a certain period of theoretical study, as stipulated in the curriculum. Internship in this form is usually not remunerated except for the situation provided by the law, when during the practice period, the practice partner decides to hire the practitioner on a fixed-term individual labour contract, according to the Labour Code, and negotiating the remuneration.

In Romania there are no specific tax laws in favour of companies engaged in WBL initiatives and no special tax reductions. However, all costs for the companies involved in the work-based learning of IVET learners such as fees, equipment, materials, travel, accommodation, meals, etc. are tax-deductible (deductible expenses for determining the tax result) according to the relevant legislation on education and the fiscal code.

WBL in Poland

In Poland WBL is part of the vocational education which is regulated by the Act on the Education System as well as the Regulation of the Ministry of National Education of 23 December 2011 on the classification of professions for vocational education and the Regulation of the Ministry of National Education of 7 February 2012 on the core curriculum of vocational education (as amended).

VET is based on two types of school: basic vocational schools (BVS) and technical upper secondary schools. The practical part of vocational education can be performed as work-based learning (in school workshops, continuing education centres and practical training centres or with an employer) or as on-the-job training (which is mandatory for vocational upper secondary and post-secondary programmes and lasts from 4 to 12 weeks, depending on the type of job).

Based on the country report, it is not clear whether there is specific labour legislation dealing with the apprenticeship, internships or other WBL initiatives. Under current legislation practical classes can be held with employers on the principles of the dual education system, based on two types of contracts:

- Employment contract for vocational training, concluded between the student and the employer;
- A apprenticeship contract between the school principal and the employer of apprenticeship students.

In the dual system in Poland during their training, students attending vocational schools have the status of a juvenile worker. Therefore, there is a special type of practical training which is juvenile employment for the purpose of vocational training for young people between 16 and 17 years with lower secondary education.

In Poland, just like in Romania, there is lack of financial incentives for companies or VET providers to accept students for practical classes. Though employers who provide practical training to students from vocational schools can receive some support like refund of trainers' salaries, refund of the extra salary paid to instructors, refund of the cost of work clothes and necessary protective measures, training allowance, and refund of the bonus for work placement supervisors.

Since 2014, employers are given also the opportunity to use the National Training Fund, which is part of the labour Fund to finance training for their employees and in some cases, funding can cover up to 100 % of the costs.

WBL in Germany

In Germany, the majority of all training is structured by a dual training system (WBL). In total, there are about 330 dual training programmes that can be completed full-time or part-time. Dual training lasts between two and three and a half years and is assigned to ISCED Level 354.

In contrast to purely school-based training, dual training consists of two places of learning. The predominant part, practical training, takes place in the training company and school-based training takes place in a vocational school (one to two days a week or several weeks in teaching blocks). The vocational school is financed by the state, imparts specialist and general educational skills and is the responsibility of the federal states. There is also the possibility of completing dual training with an external provider with internships in a company (vocational training in an external institution (BaE)). The practical training is the responsibility of the training company, whereby the trainers must be qualified through the trainer aptitude examination or the master craftsman's certificate. All vocational qualifications acquired through the dual training system are classified in the German Qualifications Framework (Deutscher Qualifikationsrahmen, DQR).

Due to the shared responsibility, a high level of commitment and a clear division of tasks between industry, trade unions, the federal government and the federal states are required.

Dual training, and thus the responsibility of the individual institutions, is anchored in law in the Vocational Training Act (Bundesbildungsgesetz, BbiG) and in the Crafts Code (Handwerksordnung, HwO). In addition, there are training regulations for each type of training, which define the training framework plan, the examination regulations, the duration of the training and when which training content must be taught. The Youth Employment Protection Act (Jugendarbeitsschutzgesetz, JarbSchG) applies to underage trainees in the dual training system.

Depending on the sector, each training company is assigned to a chamber which supervises the training and records training contracts. The trade unions in the respective occupational sector also play a major role, as they work with employers to further develop occupational profiles and stand up for the rights of trainees, as well as regulating the conditions of dual training. In addition, collective agreements are concluded between the trade unions and the employers, which also apply to dual training relationships. In companies in which there is a work council/staff council, it is possible to elect a youth and trainee representation (Jugendarbeitsschutzgesetz, JAV). It has a say in the design of the dual training system and is regarded as the point of contact for trainees. The Federal Institute for Vocational Education and Training (Bundesinstitut für berufliche Bildung, BIBB) issues recommendations for dual training, conducts research and participates in the development of new dual training occupations.

However, school-based training is not impractical either. Its structure is very similar to that of dual vocational training, since practical elements lasting several weeks are generally involved, for example in the form of internships, and in some cases a year of recognition has to be completed in the workplace (e.g. as an educator).

After the dual training there is the possibility to complete a master craftsman (1.5-4 years) or to change into an academic career (e.g. Bachelor programs incl. WBL) (3-4 years). WBL is integrated in every training level.

Oriented towards the dual training system, there are also dual courses of study in which a high degree of practical relevance is integrated. They are offered either by companies themselves or by universities and have different models. In many non-dual degree programmes, there is the possibility of having an internship credited or is even obligatory.

There are no specific tax incentives for companies that participate in WBL initiatives, dual training. And there is no specific public register listing the companies participating in dual training.

Further information about the education system can be found at: https://cumulus.cedefop.europa.eu/files/vetelib/2019/Vocational_Education_Training_Europe_Germany_2018_Cedefop_ReferNet.pdf (page 13).

WBL in Portugal

In Portugal there is no specific overall legislation regulating WBL.

WBL is regulated as a cross-section subject under other legislation. For example, in 2007 alongside the creation of the National Qualifications System (SNQ), six VET – dual education programmes were established and each of them has its own legislation/regulation, where WBL is addressed.

Other WBL initiatives that are not under the SNQ scope, including state-funded and non-state-funded internships, are also regulated independently.

The responsible institution for setting all aforementioned legislation is the government and the legislation is the same in the whole country.

In Portugal, for state-funded initiatives, companies must be law-abiding and meet the legal requirements linked to their activity and in terms to registration, accounting, taxes. In this case the institute for employment and vocational training bears the responsibility to ensure the company complies with the law. Otherwise no specific legal requirements have to be met and there is no public register for companies authorized to participate in WBL initiatives.

Nevertheless, it should be noted that for the VET – dual education programmes, it is, typically, up to the VET provider to form a partnership with companies which host learners during WBL. The VET providers also need to maintain their certification and are, thus, audited frequently. During the audit, the criteria for selecting the companies are assessed together with the teaching methods that feature mechanisms for monitoring and evaluating of the WBL activities. But there is no evidence that companies who participate in WBL initiatives are subject to more regular audits from labour monitoring institutions.

There is no specific labour legislation dealing with apprenticeships, internships, other WBL initiatives. Common rules for WBL initiatives stipulate that a contract between all parties involved must be signed. It should be acknowledged that learners have the right to receive meal and transport subsidies, and work insurance from the company. The remaining contract aspects, including maximum working time and working schedule, are the same as those applicable to all the company's employees, which are regulated by standard labour legislation. The internship contract, generally, has a term of 9 months, except for companies of national economic strategic interest and for trainees in certain social situations (refugees, ex-convicts, etc).

In Portugal there are no specific tax incentives for companies engaged in WBL/dual education initiatives. Both the company and the trainee are subject to the applicable tax law, as if the trainee were a regular employee.

There is funding and grant legislation under the European Social Fund (ESF) which directly addresses WBL initiatives. Companies involved in internship programmes are also entitled to a financial contribution from IEFP. 65% of the trainee's monthly allowance is funded, which can be increased to 80% if it is a non-profit organisation, a company with national economic strategic interest or a company with less than 10 employees that applies for the first time. If the trainee belongs to certain social groups (refugees, ex-convicts, etc), another 15% is added to the former figure. Companies that hire trainees within 20 days after the internship is over, will be awarded a grant of twice the monthly allowance agreed in the contract.

WBL in Bulgaria

Training through work (dual education in Bulgaria) is a relatively new opportunity that has been formally introduced into the VET system in Bulgaria in 2015 and is regulated as a cross-section subject by the VET act and the Labour Code and by specific legislation - Ordinance № 1 of 8 September 2015 on the

terms and conditions of conducting training through work (dual training).

Dual education (WBL) as part of VET in Bulgaria is governed by the same institutions that are responsible for VET. There are different responsible institutions at all levels – national, regional and local.

Companies who want to participate in WBL initiatives in cooperation with VET schools need to have special permission from the General Labour Inspectorate Executive Agency to employ individuals below 18 years old. The permission is given after the General Labour Inspectorate Executive Agency inspects the working facilities and grants permission only if the work environment is deemed in compliance with all OSH standards.

There is no specific legislation dealing with the apprenticeship, internships, other WBL initiatives. Relations between the employer and the student are formalized in a contract that should be in accordance with the labour Code (LC).

A specific requirement for the dual training is that the employment contract shall be concluded at the latest two weeks before the start of the school year in which the training will be commenced. Last amendments in the Labour Code intend to support the work-based form of learning (dual) as a type of apprenticeship where:

> (a) labour contracts for training during work define the forms, place and duration of the training, the compensation which the parties owe when failing to fulfil their obligations and other issues related to training provision;
> (b) dual training lasts 1-3 years for regular VET learners;
> (c) work-based learning for employees that is not regulated by the VET act lasts six months or less;
> (d) after a successful completion of an employee's training, an employer has to make an offer and an employee has to accept a permanent job; this is not the case for VET learners in dual training.

In Bulgaria there is no specific public register where companies participating in dual training are signed.

There are no tax incentives for employers participating in WBL initiatives, projects, etc. What is more, a paradox turns out to be the fact that since employers have to conclude a labour contract with students from VET schools, they need to pay mandatory health insurance for each of the students in the company and at the same time the state pays health insurance for the same student, which results in double taxation.

There is no specific grant legislation addressing WBL/ dual training. Companies in Bulgaria can count on various initiatives aimed at promoting WBL in Bulgaria such as project DOMINO - “Swiss support for the introduction of dual track principles in the Bulgarian vocational education system” and Erasmus+ programme.

WBL in Cyprus

In Cyprus there is no specific legislation in the field of WBL. All the activities regarding the provision of continuing vocational education and training are legalized by the Council of Ministers or by legislation adopted by the House of Representatives. The main bodies responsible for formulating and implementing policy for the initial vocational education and training are the Ministry of Education and Culture (MoEC), the Ministry of Labour and Social Insurance (MLWSI), the Human Resource Development Authority (HRDA) and public higher education institutions. Additionally, work-based learning is partially governed by the Law on Equal Treatment of Men and Women in Employment and Vocational Education Law of 2002 (Law 205 (I) / 2002), along with its amendments.

Every organisation in Cyprus has the right to participate in WBL training programs, with no limitation on participation, type of business or type of training. Every employer has the ability to organize and implement, at his / her own cost, any training he / she considers to contribute to the development of his / her workforce.

The Human Resource Development Authority of Cyprus (HRDA), every six months, approves a number of training programs exclusively for employees and also internships for new entrants to the labour market which are supported by the Government of Cyprus through financing employers. Interns may or may not be salaried, depending on the organisation that is sponsoring the placement. Usually, interns receive a nominal payment, which vary depending on the employer.

If the training is an initiative of a company and is organized and implemented exclusively by the company, then there is no additional audit of the specified audits that are or would be carried out in this company.

If a company participates in vocational training programs through Human Resource Development Authority of Cyprus (HRDA) and collaborating VETs, then the Human Resource Development Authority of Cyprus is responsible for quality assurance within the implementation of the programs it adopts.

In Cyprus, in order to give companies incentives to participate in WBL initiatives, all human resource development expenditure is deducted from taxation, just like other production costs. In this way, it is estimated that the state accounts for about 20-25% of the total cost of human resources development, while the remainder is covered by private funds. On the other hand, employers must contribute every month the percentage of 1% on the salary of each employee in the Human Resource Development Fund.

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Here is the list of all of the external sources used in the process of creating this handbook:

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